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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,561	11/28/2003	Makoto Terui	OHG 147	4986
23995	7590	10/05/2004	EXAMINER	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			WARREN, MATTHEW E	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/722,561	Applicant(s) TERUI, MAKOTO	
	Examiner Matthew E Warren	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18, 19, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 17 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/22/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Maruyama (US 6,228,684 B1).

In re claim 1, Maruyama shows (figs. 4 an 5) a semiconductor device, comprising; a semiconductor chip (11) which has a circuit region (12) defined in the central part thereof and a wiring region (outside of region 12) which surrounds the circuit region; an integrated circuit (within 12) which is formed on the circuit region; a plurality of electrode pads (13) which are formed on the circuit region and which are connected the integrated circuit; plurality of first external terminals (14) which are arranged over the circuit region; a plurality second external terminals (16) which are arranged over the wiring region; a first redistribution wiring (23) which connects the electrode pad to the first external terminal; a second redistribution wiring (15) which connects the electrode

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pad to the second external terminal; and a sealing film (22) which covers over the circuit region and wiring region such that first (14) and second external terminals (16) are exposed from the sealing film.

In re claim 12, Maruyama shows (fig. 5) that a plurality of electrode pads (13) are formed along the boundary between the circuit region and the wiring region.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama (US 6,228,684 B1) as applied to claim 1 above, and further in view of Aoki (US Pub. 2002/0149086 A1).

In re claims 2-11, 13, and 14, Maruyama shows all of the elements of the claims except the passive element provided in the wiring region. Aoki shows (figs. 15A-15C) the device further comprising a passive element (L or C) which includes a capacitor or inductor, is provided on the wiring region, and which regulates the electrical characteristics of the second redistribution wiring. The passive element may be a plurality of capacitors (C1 and C2) or inductors which are standardized or formed in an array so as to have the same size. In fig. 14, the passive element being a capacitor is formed in a layer in which a redistribution rewiring (4) is formed. In fig. 11, the passive

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element being a capacitor, is formed in a layer that lies beneath layer in which a redistribution wiring (8) formed. In fig. 15B The redistribution wiring comprises a wiring part (connected to 10) that connects the electrode pad to the passive element and another wiring part that connects the passive element to the second external terminal (6). The device includes a passive element electrode pad (12-2), in which the passive element is connected to the wiring part (10) via the passive element electrode pad. The device further comprises (fig. 14) a first or second post electrode (6) having an external terminal (B) provided on its top surface and a first or second redistribution wiring (connected to electrode 2 or 5-2) connected to its bottom surface. With this configuration, a passive component can be formed in the wiring layers to provide an antenna or signal filtering. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the wiring of Maruyama by forming a passive element in the wiring layer as taught by Aoki to provide an antenna or signal filtering.

Claims 15, 16, 18, 19, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama (US 6,228,684 B1) in view of Aoki (US Pub. 2003/0149086 A1).

In re claim 15, Maruyama shows (figs. 4 and 5) a semiconductor device, comprising: a semiconductor substrate (11) which has a first region (12) that is provided with a plurality of circuit element connection pads (13), and a second region that surrounds the first region; a plurality first external terminals which arranged on the first

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region (14); a plurality of second external terminals (16) which are arranged on the second region; a plurality of first wiring structures (23) which are formed in the first region, and electrically and individually connecting a plurality of the first external terminals and first predetermined number of the circuit element connection pads; a plurality of second wiring structures (15) which are formed ranging from the first region to the second region, and electrically and individually connecting a plurality of the terminals and a second predetermined number of second external circuit element connection pads. Maruyama shows all of the elements of the claims except a passive element which is electrically connected to one of the second wiring structures. Aoki shows (figs. 15A-15C) a semiconductor device further comprising a passive element (L or C) which includes a capacitor or inductor and is provided on the wiring region and which regulates the electrical characteristics of the second redistribution wiring. With this configuration, a passive component can be formed in the wiring layers to provide an antenna or signal filtering. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the wiring of Maruyama by forming a passive element in the wiring layer as taught by Aoki to provide an antenna or signal filtering.

In re claim 16 and 19, Aoki shows (fig. 15A-15C) semiconductor device wherein when combined with Maruyama; the first wiring structures contains a redistribution wiring layer which individually connected to one of the first predetermined number of the circuit element connection pads, and a first post electrode (6) which electrically and individually connects the first redistribution wiring layer (10) and the one of the first

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external terminals (B). When Aoki is further combined with Maruyama, each of the second wiring structures contains a second redistribution wiring layer which is formed ranging from the first region the second region and is electrically and individually connected to one of the circuit element connection pads, and a second post electrode (6) which electrically and individually connects the second redistribution wiring layer (10) and one of the second external terminals (B). The passive element (L, C1, or C2) is electrically connected to one of the second redistribution wiring layer.

In re claim 18, 21, and 22, Aoki shows fig. (15A-15C) that the passive element that is connected to the redistribution wiring layer is an inductor (L) which has two passive element electrode pads (connected to wiring layer 10) connected at ends of the inductor. The pads of the inductor are connected to the redistribution layer (10). The passive elements may be arranged in an array when combined with the routing array of Maruyama.

Allowable Subject Matter

Claims 17 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Terui et al. (US Pub. 2003/0189251 A1) and Yamasaki (US

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6,433,422 B1) also show semiconductor devices having redistribution wiring and specified routing schemes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E Warren whose telephone number is (571) 272-1737. The examiner can normally be reached on Mon-Thur and alternating Fri 9:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MEW

MEW
September 30, 2004

Tom Thomas
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